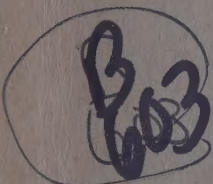


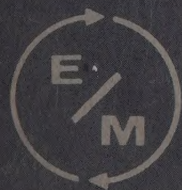
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INSTRUCTION MANUAL



POWER SUPPLY
REGATRON MODEL 219-B

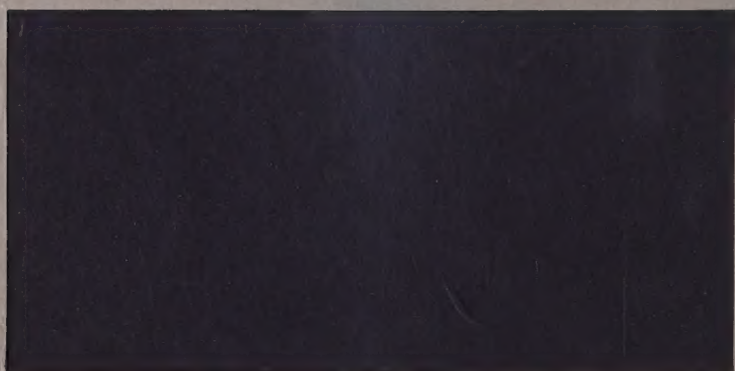
Serial No. _____



**ELECTRONIC
MEASUREMENTS**
COMPANY, INCORPORATED

EATONTOWN

NEW JERSEY





ELECTRONIC
MEASUREMENTS
COMPANY, INCORPORATED
EATONTOWN NEW JERSEY

TWX: EATONTOWN, N. J. 984

TELEPHONE: LIBERTY 2-0300

POWER SUPPLY

REGATRON MODEL 219-B

Serial No. _____

Issued: August 16, 1954

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883

ELECTRONIC MEASUREMENTS COMPANY, INC.
LEWIS STREET AND MAPLE AVENUE
EATONTOWN, NEW JERSEY
TELEPHONE - LIBERTY 2-0300

REGATRON MODEL 219-B SPECIFICATIONS

Output Voltages:

1. 0 to 600 V. D.C. at 1,000 ma;
100 ma. as a voltage standard.
2. 0 to 150 V. D.C. at 5 ma.
3. 6.3 V. A.C. at 10 amps center-
tapped, unregulated.

Regulation Factor:

0 to 600 V. output: Within 50 mv.,
no load to full load; within
5 mv. as a voltage standard.
Within 50 mv. or 0.05% for line
from 105 to 125 V.

0 to 150V. output: VR regulated
with 50,000 ohm pot for control;
1/2% load regulation; immune to
line variations.

Hum Voltage:

0 to 600 V. output: Within 800
microvolts up to 100 V., or
within 1.5 mv. up to 600 V. with-
in 500 mv as voltage standard.
0 to 150 V. output: Within 1 mv.

Stability:

0 to 600 V. output: $\pm .15\%$ or .1 V.
after warm-up.
0 to 150 V. output: That of an
OA2 VR tube at fixed current,
(for a given load).

Calibration:

0.25% or 0.25 V.

Modulation:

Input Impedance: 200 ohms.
Gain: 0.5
Capability: D.C. - ± 15 V. 20 cps -
10 V., full load; 0.5V. no load.
1,000 cps - 1 V., full load;
10 mv., no load.

Line Input:

105 to 125 V. A.C., 50 to 60 ~.

Power Consumption:

Approx. 1,200 watts at full load.

Meters:

Voltmeter: 600 V. or 150 V.
full scale; minus 150 V.
full scale for bias. ~

Milliammeter: 1,000 ma. full scale.

Electrical Vernier:

0 to 3V., usable anywhere in
range of high voltage.

Output Terminations:

All outputs at front binding
posts, with reversible ground.
Positive of 150 V. output
permanently connected to
negative of 600 V. output.

Overload Protection:

Line and high voltage supply
fused. Time delay relay
included.

Finish:

Gray wrinkle with machine en-
graved designations.

Mounting:

Table or relay rack; carrying
handles included.

Dimensions:

Panel: 10-1/2" X 19".
Overall: 10-1/2" X 19" X 15".

Weight:

Approximately 85 pounds.

1. PRELIMINARY:

To operate this unit, proceed as follows:

- (a) Place the switches and controls in the following positions:
 1. Line switch - off (down).
 2. High voltage switch - off (down).
 3. H.V. control - minimum (maximum counterclockwise).
 4. Electrical vernier - zero.
 5. Bias control - minimum (maximum counterclockwise).
 6. Meter switch - plus 600.
- (b) Make load connections to the binding posts at the front of the unit. The grounded post should securely compress the connecting device or lead as well as the grounding link.

NOTE

The regulation of this unit is measured at the binding posts; in use, the load leads should be made heavy enough to reduce the drop to acceptable limits.

- (c) Plug the line cord into an outlet providing 115 volts A.C. at 50 to 60 cycles. Operate the line switch to the on position (green indicator will glow). A time delay relay is provided in this unit to permit adequate tube warm-up. The delay period is approximately one minute.
- (d) Apply voltage to the load by operating the H.V. Switch to the on position (up). This will be indicated by the red indicator light.

WARNING !!

This light comes on when the switch is turned on, even if the delay period is incomplete, to indicate that high voltage may come on at any time. Caution should be observed whenever this switch is on.

2. ADJUSTMENT OF VOLTAGES:

- 2.1 Bias: The bias may be read by operating the meter switch to the minus 150 position. Bias may then be adjusted with the panel control from zero to 150 volts.

NOTE

Bias is not turned off by the H.V. Switch.

- 2.2 High Voltage: The high voltage control covers the range from zero to 600 volts in ten turns, providing 60 volts per turn. To determine the correct output voltage, it is necessary to know the last multiple of 60 swept by the dial. To make this possible, the voltmeter has continual markings every 10% from zero to 600 volts. Thus, by noting the increments between which the reading lies, and adding the dial position to the last previous multiple of 60, the total reading is determined.

Example: Voltmeter reading between 240 and 300.
Dial reading 25.5
Output voltage = $240 + 25.5 = 265.5$

- 2.3 Vernier Control: The calibration applies with the vernier control set at zero. When the vernier is operated to any value between zero and 3 volts, the indicated voltage is added to the output voltage at any point in the range.

3. REVERSAL OF POLARITY:

This power unit has been designed so that either side of the high voltage may be grounded by the user or control. The unit is normally regulated with the negative side grounded. To reverse polarity, disconnect the three high voltage wiring posts, swing the link to the other end, and reinsert the two posts on the link. Load connection for the ground side may be inserted either under the ground post or the ground terminal.

WARNING !!

For safety, always be sure that the case or ground of external equipment is connected to the grounded side of the power circuit.

The high voltage may be operated with neither side grounded, provided the potential between this supply and the case is kept low.

4. MODULATION:

The output voltage may be offset by a D.C. signal, or alternatively modulated by an A.C. signal by inserting the appropriate voltage into the MOD post. The other side of the modulating source should be returned to the small ground post adjacent to the MOD post.

NOTE

When the positive terminal of the high voltage is grounded the MOD post carries the negative high voltage, hence a blocking capacitor will be required. This blocking capacitor should be of sufficient size to pass the desired modulating frequency and of sufficient voltage rating to withstand the negative high voltage. In selecting this capacitor, bear in mind that the input resistance is 200 ohms.

Modulation may also be applied between the MOD posts and the negative terminal of the high voltage; however, with positive grounding this will elevate the modulating source to negative high voltage.

III. MAINTENANCE

1. REPLACEMENTS:

When replacements are required, any parts may be used of the value and tolerances indicated on the circuit diagram with the exception of the items listed below. Appropriate directions are given in each case.

1.1 V5, 12AX7, V11, 6B2.

Changing either of these tubes may effect the zero balance so it should be checked in accordance with instructions above.

1.2 V10, 5651.

Changing this tube may effect the reference voltage. Accordingly, if a source of standard voltage is available, the reference adjustment should be reset.

1.3 Multi-turn potentiometer:

If this potentiometer develops a fault, it is recommended that advice be sought from the factory. After consideration of the facts involved, shipping and other instructions will be forwarded.

1.4 Resistors RW1, RW2, RW3, RW4, RW5, RW6.

If any of these become defective, obtain replacement parts from the factory. Give the serial number of the instrument.

2. SERIES TUBES:

If, at any time, it is believed that one or more series tubes and associated circuits are faulty, this may be checked as follows:

- (a) Remove all series tubes but one
- (b) Turn the equipment on and apply a load of 200 ma. at some low voltage. Check ripple and regulation.
- (c) Remove this series tube and place another series tube in another socket and repeat (b).
- (d) Repeat (b) for every other socket and tube, taking one at a time.
- (e) If one or more of the circuits shows faulty, repeat the test in each case using a tube known to be good.
- (f) If a favorable result is obtained, it may be taken that the previous tube is faulty. If not, the associated circuits should be checked for faults.

3. CALIBRATION:

Three calibrating adjustments are provided on the chassis of this unit as follows:

3.1 Zero adjustment.

The zero adjustment is used to set the input comparator system to a zero level, which then holds over the entire operating range. This control may be found to the right of the variac just behind the front panel (looking from front). To set this adjustment, proceed as follows:

- (a) Rotate the H V. and electrical vernier controls to zero.
- (b) Connect a voltmeter to the high voltage output terminals (full scale sensitivity 3 volts D C. or less).
- (c) Set this control to obtain a reading of zero. A very sensitive indication may be obtained by alternately connecting and disconnecting the voltmeter lead.

3.2 Calibration:

The calibration adjustment should not be moved unless a highly precise meter or source of voltage is available in the range from 200 to 600 volts. The preferred calibrating voltage is 300 volts, if available. To calibrate, proceed as follows:

- (a) Connect the power unit to the measuring device.
- (b) Set the high voltage control to the calibrating voltage.
- (c) Adjust the calibrating control to read correctly.

If a source of standardizing is available, make connections as indicated below:



The comparison meter should have a full scale sensitivity of 3 volts or less but should be set to a relatively insensitive range to begin calibration. Then proceed as follows:

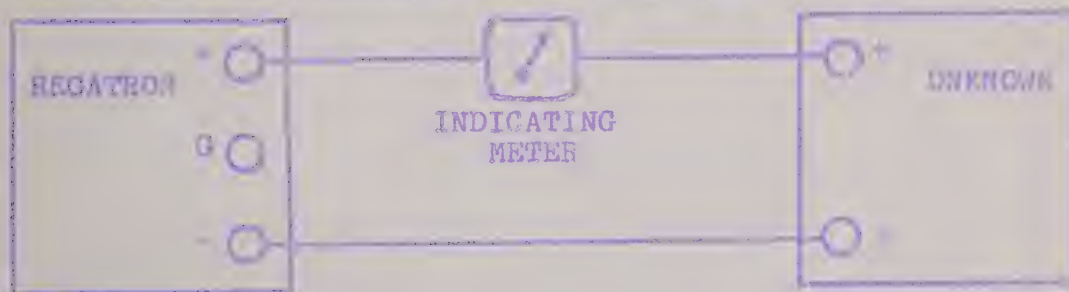
- (a) Set the output voltage of the REGATRON to the calibrating potential.
- (b) Increase the sensitivity of the voltmeter until an on-scale reading is obtained.
- (c) Bring the reading to zero using the calibration control.

3.2 Reference adjustment

A reference voltage of about 900 volts (measured with negative ground on the H.V.) is employed in this unit. It may be calibrated as above using the reference adjustment. The reference voltage is available at the bottom of the reference unit on the exposed bus marked with red paint. The reference sub-assembly is at the left of the chassis (from top front).

IV. USE AS A COMPARISON VOLTMETER

Because of its calibration, this power unit may be employed as a comparison voltmeter. To do this, set up connections as indicated below and proceed as follows:



- (a) With the indicating meter set on the least sensitive range, rotate the high voltage control to reduce the reading.
- (b) Progressively increase the sensitivity of the voltmeter and reduce the difference as above.
- (c) When the difference has been reduced to zero, read the voltage from the calibrated dial as described elsewhere.

V. TRANSISTOR APPLICATIONS

1. RESOLUTION:

Because of the high resolution of the ten turn potentiometer, the lower voltages normally employed in transistor work can easily be set. Where still higher resolution is desired, the ten turn control may be used for a coarse setting and the electrical vernier for fine setting. For voltages of less than 3 volts, the electrical vernier alone may be used, with the main control set at zero.

2. SMALL SIGNAL MEASUREMENTS:

One method for the measurement of transistor parameters requires the superposition of a small A.C. signal on one of the D.C. potentials. This unit is particularly suitable for this since the D.C. voltage may be set independently and modulation then introduced to provide the required small signal (subject to the instructions given above). In this connection it should be noted that more modulation is available as the load current is increased (due to the reduced time constant of the output system). Accordingly, where the available modulation is insufficient at loads less than maximum, some additional D.C. load may be added to permit greater modulation.

VI. BRIDGE MEASUREMENTS

As described for transistor applications, this unit may be used to provide separately adjustable A.C. and D.C. excitation for bridges, strain gauges, etc.

W A R R A N T Y

REGATRON instruments are guaranteed to be free from defects in material and workmanship for one year from the date of purchase (except for tubes, fuses and batteries). Our liability under this warranty is limited to repairs and adjustments or replacements of defective parts or instruments when the fault is a direct result of defective materials or workmanship in the manufacture of the apparatus. This warranty covers service for the first year, except for transportation to and from the factory.

If, during subsequent service, any fault develops in the equipment, the following steps should be taken:

1. Notify ELECTRONIC MEASUREMENTS CO., INC., giving full particulars of the difficulty and include the serial number of the instrument in question. On receipt of this information, we will give you service information or shipping instructions.
2. On receipt of shipping instructions, forward the apparatus to us, prepaid, and we will make repairs and adjustments immediately at the factory.
3. If the fault has been caused by misuse, or abnormal conditions of operation, as disclosed by our examination, repairs will be billed at cost. In this case, an estimate of the cost will be submitted before work is started.

CLAIM FOR DAMAGE IN SHIPMENT

This instrument received comprehensive visual and electrical inspections before shipment. Immediately upon receipt from the carrier, and before operation, this instrument should be inspected visually for damage caused in shipment. If such inspection reveals internal or external damage in any way, a claim should be filed with the carrier. A full report of the damage should be obtained by the claim agent and this report should be forwarded to us. We will then advise you of the disposition to be made of the equipment and arrange for repair or replacements. When referring to this instrument, always include the model and serial numbers.

